

Sustaining Members

Society of American Bacteriologists

ABBOTT LABORATORIES.....North Chicago, Ill.
A. S. ALOE COMPANY

St. Louis, Mo., and Los Angeles, Cal.
AMERICAN AGAR AND CHEMICAL CO..San Diego, Cal.
AMERICAN CYANAMID COMPANY

Bound Brook, New Jersey
AMERICAN INSTRUMENT Co., Inc., Silver Spring, Md.
AMERICAN STERILIZER COMPANY.....Erie, Pa.
ANHEUSER-BUSCH, INC.....St. Louis, Mo.
ARMOUR LABORATORIES.....Chicago, Ill.
BALTIMORE BIOLOGICAL LAB.....Baltimore, Md
BAUSCH & LOMB OPTICAL CO....Rochester, N. Y.
THE BORDEN COMPANY...New York 17, New York
BRAMHALL, DEANE COMPANY...New York, N. Y.
CENTRAL SCIENTIFIC COMPANY.....Chicago, Ill.
CLAY-ADAMS COMPANY, INC....New York, N. Y.
THE COCA-COLA COMPANY.....Atlanta, Ga.
COLE CHEMICAL COMPANY.....St. Louis, Mo.
THE COLEMAN AND BELL COMPANY..Norwood, Ohio
CUTTER LABORATORIES.....Berkeley, Calif.
DIFCO LABORATORIES, INC.....Detroit, Mich.
DIVERSEY CORPORATION.....Chicago 4, Illinois
FISHER SCIENTIFIC-EIMER AND AMEND

New York 14, N. Y.
FLEISCHMANN LABORATORIES...New York, N. Y.
GENERAL CHEMICAL COMPANY...New York, N. Y.
THE GILLILAND LABORATORIES, INC., Marietta, Pa.
HOFFMANN-LAROCHE, INCORPORATED

Nutley, New Jersey
HYNSON, WESTCOTT & DUNNING..Baltimore, Md.
INTERNATIONAL EQUIPMENT CO...Boston, Mass.
KIMBLE GLASS COMPANY.....Vineland, N. J.
LAMBERT PHARMACAL COMPANY...St. Louis, Mo.
LEDERLE LABORATORIES, INC....New York, N. Y.
ELI LILLY & COMPANY.....Indianapolis, Ind.
MEAD JOHNSON AND COMPANY..Evansville, Indiana
MERCK AND COMPANY, INC.....Rahway, N. J.
THE WILLIAM S. MERRELL CO....Cincinnati, Ohio
NATIONAL ANILINE & CHEMICAL COMPANY, INC.

New York, N. Y.
NATIONAL OIL PRODUCTS Co.....Harrison, N. J.
NATIONAL SUGAR REFINING Co..New York, N. Y.
NEW YORK MEDICAL EXCHANGE

New York 17, New York
PARKE, DAVIS & COMPANY.....Detroit, Mich.
PITMAN-MOORE COMPANY...Indianapolis, Indiana
RADIO CORPORATION OF AMERICA

Camden, New Jersey
REPUBLIC FILTERS, INC.....Paterson, N. J.
S.M.A. CORPORATION.....Chicago, Ill.
SCANLAN-MORRIS COMPANY.....Madison, Wisc.
SCHIEFFELIN AND COMPANY.....New York, N. Y.
SCHWARZ LABORATORIES, INC...New York 17, N. Y.
JOSEPH E. SEAGRAM AND SONS, INC., Louisville, Ky.
SEALTEST, INC.....New York, N. Y.
SHARP AND DOHME, INC.....Philadelphia 1, Pa.
SPENCER LENS COMPANY.....Buffalo, N. Y.
THE TECHNICON COMPANY.....New York, N. Y.
ARTHUR H. THOMAS COMPANY..Philadelphia, Pa.
WALLACE AND TIERNAN PRODUCTS, INCORPORATED

Belleville, New Jersey
WALLERSTEIN COMPANY, INC...New York 16, N. Y.
WILLIAM R. WARNER AND Co...New York, N. Y.
WILL CORPORATION.....Rochester, N. Y.
WILMOT CASTLE COMPANY.....Rochester N. Y.
WINTHROP CHEMICAL COMPANY...New York, N. Y.
WISCONSIN ALUMNI RESEARCH FOUNDATION

Madison, Misc.
WYANDOTTE CHEMICALS CORPORATION
Wyandotte, Mich.
JOHN WYETH AND BR., INC.Philadelphia, Pa.

Pointing to opportunities for research workers in biology and medicine

Many of the immense advances in our knowledge of the minute structure of living things have been made as a result of team work between the biological and physical sciences. And we may believe that more surprises are in store.

MICROSCOPIC TECHNIQUE in Biology and Medicine

was written by E. V. Cowdry (*Professor of Anatomy, Washington University*) with the purpose of "exposing in an introductory way a few of the many opportunities."

Extends the horizon

Shows possibilities of improving old techniques, replacing others by new ones, indicates advantages of microchemical and physical procedures that are often not explored as they should be.

Offers specific information

Anticipating the needs of tomorrow, Professor Cowdry, a successful and enthusiastic research worker himself, provides definite information about specific matters rather than general statements. (The latter are limited to short discussions of choice of Methods, Organization of Laboratory, and Standardization of Stains.)

You may turn to the names of structures (*Nissl Bodies, Nerve Fibers, Capillaries*) or of elements (*Iron, Potassium, Calcium*), of enzymes (*Pepsin, Phosphatase*) and of many other components of living material that can be localized microscopically.

Techniques for the determination of permeability, viscosity, pH and other properties of tissues are likewise included. For many techniques information is also supplied under the names of those who discovered them (*Giemsa and Mallory* for instance). Synonyms for the important dyes are listed.

Alphabetical arrangement

All information is directly and quickly accessible under more than a thousand headings. In addition there are hundreds of cross references. References to the literature are supplied for follow up. (6 x 9) 206 pages (double column arrangement). Published June, 1943. \$4.00

The Williams & Wilkins Co.
Baltimore, 2, Md.

BACTERIOLOGICAL REVIEWS

FOUNDED IN 1937

Published by the SOCIETY OF AMERICAN BACTERIOLOGISTS

VOLUME 9

March, 1945

NUMBER 1

Editor

BARNETT COHEN

The Johns Hopkins Medical School
Baltimore 5, Md.

Associate Editors

GEORGE P. BERRY

N. PAUL HUDSON

W. C. FRAZIER

CARL S. PEDERSON

C. B. VAN NIEL



Contents

Physical Methods of Sterilization of Microorganisms. OTTO RAHN	1
---	---

BACTERIOLOGICAL REVIEWS

Manuscripts should be sent to Prof. Barnett Cohen, 710 N. Washington St., Baltimore, Md. *One hundred reprints*, without covers, of articles will be furnished gratis to contributors when ordered in advance. A table showing cost of additional reprints, with an order slip, is sent with proof.

Correspondence concerning business matters should be addressed to The Williams & Wilkins Company, Mount Royal and Guilford Avenues, Baltimore, U. S. A.

BACTERIOLOGICAL REVIEWS is issued quarterly in March, June, September, and December. The four numbers published in one calendar year constitute a volume.

The subscription price is \$4.00 per volume. For countries outside the Postal Union, add 50 cents a volume. Bacteriological Reviews is delivered free, however, to all subscribers to the Journal of Bacteriology.

Claims for copies lost in the mails must be received within 30 days (domestic). For the duration of the war, delivery overseas cannot be guaranteed and must be at subscriber's risk. Changes of address must be received within two weeks of the date of issue.

Subscriptions should be renewed promptly—To avoid a break in your series, subscriptions should be renewed promptly. The publishers cannot guarantee to supply back issues on belated renewals.

Subscriptions, new or renewal, should be sent to the Publishers or to Agents listed below.

AGENTS

For Australia: Angus & Robertson, Limited, 89-95 Castlereagh Street, Sydney.

For the British Empire, except Australia and Canada: Baillière, Tindall & Cox, 8 Henrietta St., Covent Garden, W.C. 2, London, England.

For Canada: Wm. Dawson & Sons, Ltd., 70 King Street East, Toronto.

THE WILLIAMS & WILKINS COMPANY

Publishers of Scientific Books and Periodicals

BALTIMORE, U. S. A.



PUBLISHERS OF: *Medicine, Journal of Urology, Journal of Pharmacology and Experimental Therapeutics, American Journal of Tropical Medicine, Journal of Immunology, Journal of Industrial Hygiene and Toxicology, Quarterly Review of Biology, Journal of Bacteriology, Chemical Reviews, Soil Science, Social Forces, Journal of Comparative Psychology, Occupational Therapy and Rehabilitation, The American Journal of Clinical Pathology, Journal of Physical Chemistry, Philosophy of Science, Journal of Organic Chemistry, Medical Classics, Bacteriological Reviews, Human Fertility, Medical Care, Psychosomatic Medicine, Gastroenterology.*